

IN THE CLAIMS:

1. (Previously Presented) A method of patterning a layer of photoresist which has been applied over a photomask substrate, comprising:

 exposing a surface of said photoresist applied over said photomask to pattern imaging radiation; and

 prior to development of said photoresist to form a pattern, applying a vacuum to said surface of said photoresist for a period of time ranging from about 10 minutes to about 70 hours to allow pattern imaged critical dimensions to equilibrate across said photoresist present on said photomask surface, wherein said vacuum applied to said surface of said photoresist ranges from about 5×10^{-6} mTorr to about 5 mTorr, whereby an improvement in critical dimension and uniformity in a subsequently developed photoresist pattern is obtained as a result of the application of said vacuum to said surface of said photoresist prior to development.

2. (Previously Presented) A method in accordance with Claim 1, wherein exposure of said imaged photoresist to said vacuum is performed at a substrate temperature within the range of about 18°C to about 60°C.

3. (Previously Presented) A method in accordance with Claim 2, wherein exposure of said imaged photoresist to said vacuum is performed at a substrate temperature within the range of about 18°C to about 40°C, for a period of time within the range of about 20 minutes to about 12 hours.

4. (Original) A method in accordance with Claim 1, wherein said radiation is e-beam radiation.

5. (Original) A method in accordance with Claim 1, wherein said imaging radiation is optical radiation.

6. (Original) A method in accordance with Claim 1, wherein exposure of said imaged photoresist to said vacuum is performed prior to the performance of a post-exposure bake process.

7. (Cancelled)

8. (Previously Presented) A method of patterning a layer of photoresist which has been applied over a photomask substrate, comprising:

exposing said photoresist applied over said photomask to imaging radiation;

developing said photoresist present on said photomask substrate to create a developed photoresist pattern having openings through said photoresist layer thickness; and

exposing said developed photoresist to a vacuum at a substrate temperature within the range of about 20°C to about 60°C for a period of time within the range of about 10 minutes to about 60 minutes, at a process chamber pressure ranging from about 5×10^{-6} mTorr to about 5 mTorr, whereby an improvement in line edge roughness of pattern openings of said developed photoresist is obtained.

9. (Previously Presented) A method of patterning a layer of photoresist which has been applied over a photomask substrate, comprising:

a) post-apply baking said photoresist applied over said photomask substrate;

b) exposing said photoresist applied over said photomask substrate to imaging radiation, whereby a pattern imaged photoresist is created ;

c) exposing said pattern imaged photoresist to a vacuum for a period of time sufficient to allow pattern imaged critical dimensions to equilibrate across said photoresist present on said photomask surface, at a process chamber pressure ranging from about 5×10^{-6} mTorr to about 5 mTorr for a time period ranging from about 10 minutes to about 70 hours at a temperature ranging from about 18°C to about 60°C ;

- d) post-exposure baking said imaged photoresist;
 - e) developing said imaged photoresist present on said photomask substrate to create a pattern having openings through said photoresist layer thickness; and
 - f) exposing said developed photoresist to a vacuum at a substrate temperature within the range of about 20°C to about 60°C for a period of time within the range of about 10 minutes to about 60 minutes, at a process chamber pressure ranging from about 5×10^{-6} mTorr to about 5 mTorr,
- whereby an improvement in critical dimension and uniformity, and a reduction in edge roughness of said developed pattern present on said photomask is obtained.

10. (Cancelled)

11. (Previously Presented) A method in accordance with Claim 9, wherein exposure of said imaged photoresist to said vacuum in step c) is performed at a substrate temperature within the range of about 18°C to about 40°C, for a period of time within the range of about 20 minutes to about 12 hours.

12. (Original) A method in accordance with Claim 9, wherein said radiation is e-beam radiation.

13. (Original) A method in accordance with Claim 9, wherein said radiation is optical radiation.

14. (Cancelled)

15. (Previously Presented) A method of patterning a layer of photoresist which has been applied over a photomask substrate, comprising:

- a) post-apply baking said photoresist applied over said photomask substrate;

b) exposing said photoresist applied over said photomask substrate to imaging radiation, whereby a pattern imaged photoresist is created ;

c) post-exposure baking said pattern imaged photoresist;

d) developing said pattern imaged photoresist present on said photomask substrate to create a pattern having openings through said photoresist layer thickness; and

e) exposing said developed photoresist to a vacuum at a substrate temperature within the range of about 20°C to about 60°C for a period of time within the range of about 10 minutes to about 60 minutes, at a process chamber pressure ranging from about 5×10^{-6} mTorr to about 5 mTorr, whereby an improvement in line edge roughness of pattern openings of said developed photoresist is obtained .

16. (Original) A method in accordance with Claim 15, wherein said imaging radiation is e-beam radiation.

17. (Original) A method in accordance with Claim 15, wherein said imaging radiation is optical radiation.